embodiments still allows the tie rod 150c to be tightened down by the fastener 154c and threads 153c, but since both end do not need to have the threads 153c and the fastener 154c, the cost of manufacturing is lowered.

While the preferred embodiments of the present invention have been described in detail above, many changes to these embodiments may be made without departing from the true scope and teachings of the present invention. The present invention, therefore, is limited only as claimed below and the equivalents thereof.

What is claimed is:

1. A heat exchanger comprising:
   a. a core having a thermally variable size; and
   b. a support structure connected to the core, wherein the support structure thermally deforms to accommodate variations in the size of the core.

2. The heat exchanger of Claim 1, wherein the support structure thermally deforms at a rate at least similar to a rate of change in the size of the core.

3. The heat exchanger of Claim 1, wherein the support structure thermally deforms substantially the same amount as the thermal variation in the core size.

4. The heat exchanger of Claim 3, wherein the support structure further comprises a thermally deformable member.

5. The heat exchanger of Claim 4, wherein the thermally deformable member comprises a tie rod having a planar section.

6. The heat exchanger of Claim 5, wherein the planar section of the tie rod thermally deforms at a rate so that the deformation of the support structure is substantially the same as the thermal variation in the core size.

7. The heat exchanger of Claim 4, wherein the thermally deformable member

comprises a plurality of tie rods, wherein each tie rod has a planar section.

8. The heat exchanger of Claim 6, wherein the planar section is substantially aligned with a flow passing the planar section.

9. The heat exchanger of Claim 8, wherein the support structure further comprises a first strongback and a second strongback positioned about the core, wherein the tie rod is connected between the first and second strongbacks.

10. A heat exchanger comprising:

a. a core having a first end and an opposing second end; and

b. a support structure, wherein the core is received by the support structure, wherein the support structure comprises:

i. a first strongback adjacent to the first end of the core;

ii. a second strongback adjacent the second end of the core; and

iii. a variable thickness tie rod mounted between the first strongback and the second strongback.

11. The heat exchanger of Claim 10, wherein the variable thickness tie rod has a planar center section.

12. The heat exchanger of Claim 10, wherein the variable thickness tie rod further comprises a center section and a first end, wherein the center section has a center section thickness, wherein the first end has a first end thickness, and wherein the first end thickness is greater than the center section thickness.

13. The heat exchanger of Claim 12, wherein the tie rod further comprises a set of threads at the first end.

14. The heat exchanger of Claim 13, wherein the threads have an inner thread diameter and an outer thread diameter, wherein the inner thread diameter is greater than the center section thickness.

15. The heat exchanger of Claim 13, wherein the threads have an inner thread

diameter and an outer thread diameter, wherein the inner thread diameter is at least substantially equal to the center section thickness.

16. The heat exchanger of Claim 14, wherein the support structure further comprises fasteners for securing the tie rod to the first strongback and the second strongback, wherein the fasteners are mounted between the tie rod and the first strongback and the second strongback.

17. The heat exchanger of Claim 12, wherein the tie rod has a rounded cross-section.

18. The heat exchanger of Claim 12, wherein the variable thickness tie rod further comprises a second end opposing the first end, wherein the second end has a second end thickness, and wherein the second end thickness is greater than the center section thickness.

19. The heat exchanger of Claim 18, wherein the tie rod further comprises a set of first threads at the first end and a set of second threads at the second end.

20. The heat exchanger of Claim 19, wherein the first threads have an inner first thread diameter and an outer first thread diameter, wherein the second threads have an inner second thread diameter and an outer second thread diameter, wherein the first inner thread diameter and the second inner thread diameter are greater than the center section thickness.

21. The heat exchanger of Claim 19, wherein the first threads have an inner first thread diameter and an outer first thread diameter, wherein the second threads have an inner second thread diameter and an outer second thread diameter, wherein the first inner thread diameter and the second inner thread diameter are at least substantially equal to the center section thickness.

22. A method of fabricating a tie rod comprising:
   a. obtaining a tie rod having a substantially uniform thickness; and
   b. forging the tie rod to define a planar center section.

23. The method of Claim 22, wherein the tie rod having substantially uniform

thickness has a rounded cross section.

24. The method of Claim 22, wherein the forging comprises heating the tie rod and applying pressure to the uniform thickness tie rod to form the planar center section.

25. The method of Claim 24, wherein the method further comprises defining threads in an end of the tie rod.

26. A method of fabricating a tie rod comprising:

a. obtaining a tie rod of uniform thickness;

b. forging a first end of the tie rod to broaden the thickness of the first end; and

c. applying threads to the first end of the tie rod.

27. The method of Claim 26, wherein applying the threads to the first end comprises rolling a die over the first end to define the threads in the first end of the tie rod.

28. The method of Claim 27, wherein the method further comprises:

a. forging a second end of the tie rod to broaden the thickness of the second end; and

b. applying threads to the second end of the tie rod.

29. The method of Claim 26, wherein the tie rod having substantially uniform thickness has a rounded cross section.

30. The method of Claim 27, wherein the forging comprises heating the first end of the tie rod and applying pressure to the tie rod to broaden the thickness of the first end.